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Wilmington District

John H. Kerr Dam and Reservoir

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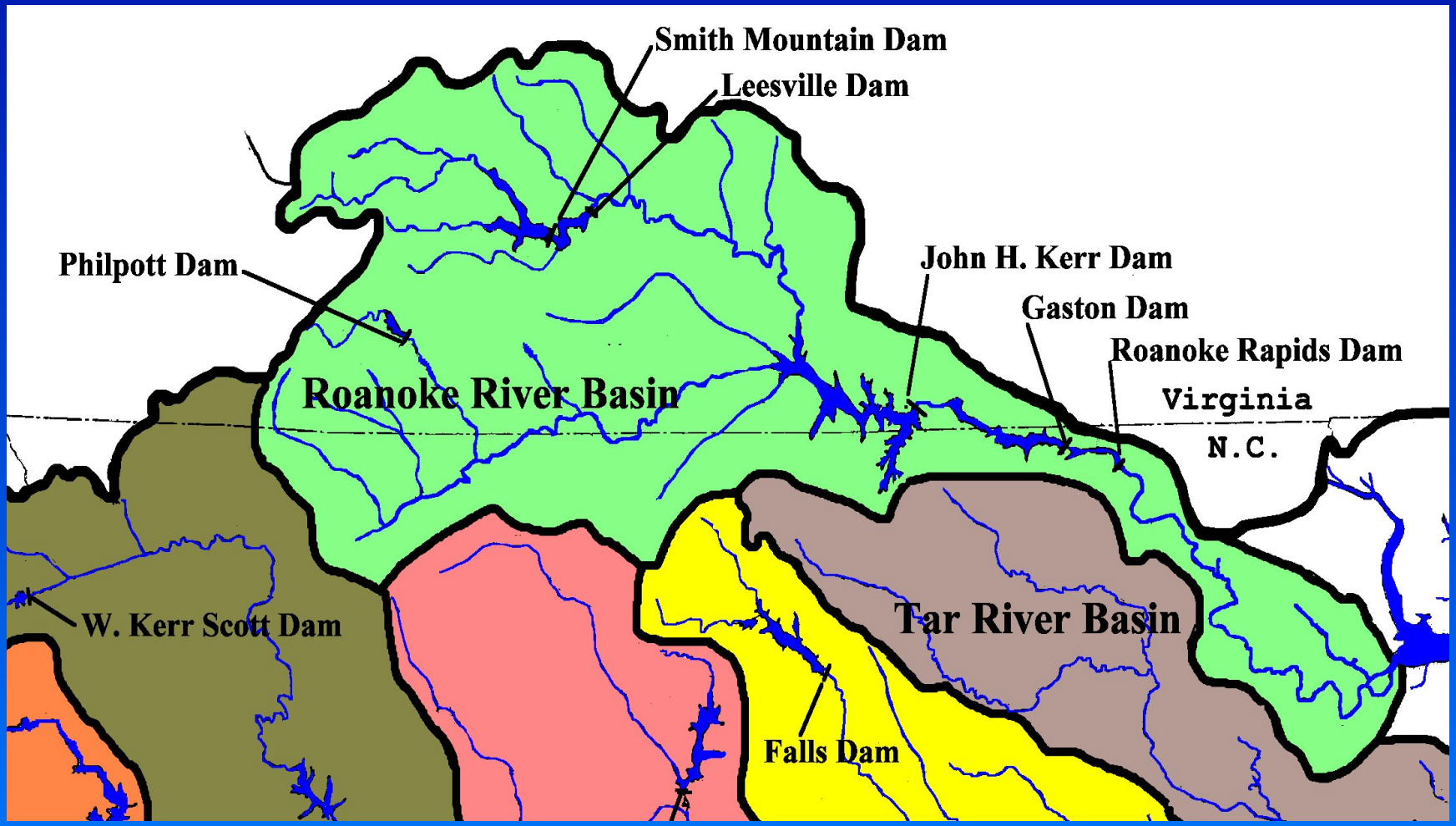
John H. Kerr Dam and Reservoir



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John H. Kerr Dam and Reservoir

Project Purposes

- Flood Control (PL 78-534, Flood Control Act of 1944)
- Hydroelectric Power (PL 78-534)
- Recreation (PL 78-534)
- Water Supply (PL 85-500)
- Fish and Wildlife (PL 85-624)
- Low Flow Augmentation (PL 78-534) no longer required because of FERC Project license number 2009 for Gaston and Roanoke Rapids

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John H. Kerr Dam and Reservoir

Pertinent Information

- Large interest in flood control following the August 1940 flood resulted in authorization of John H. Kerr
- Construction Contract was awarded April 1948
- Construction completed in June 1951
- Filling began on 30 June 1952
- Watershed drainage area of 7800 square miles
- Reservoir Surface Area at Elev. 300 of

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John H. Kerr Dam and Reservoir

Pertinent Information

- Top of Dam at elevation 332
- Lowest portion of dam is at elevation 188
- 22 tainter flood gates 42’ wide by 32’ tall
- Tainter gate discharge capacity at 320 is 615,000 cfs
- 6 turbines rated at 32,000 kw each
- 1 turbine rated at 12,000 kw
- 2 station service units rated at 1,000 kw each

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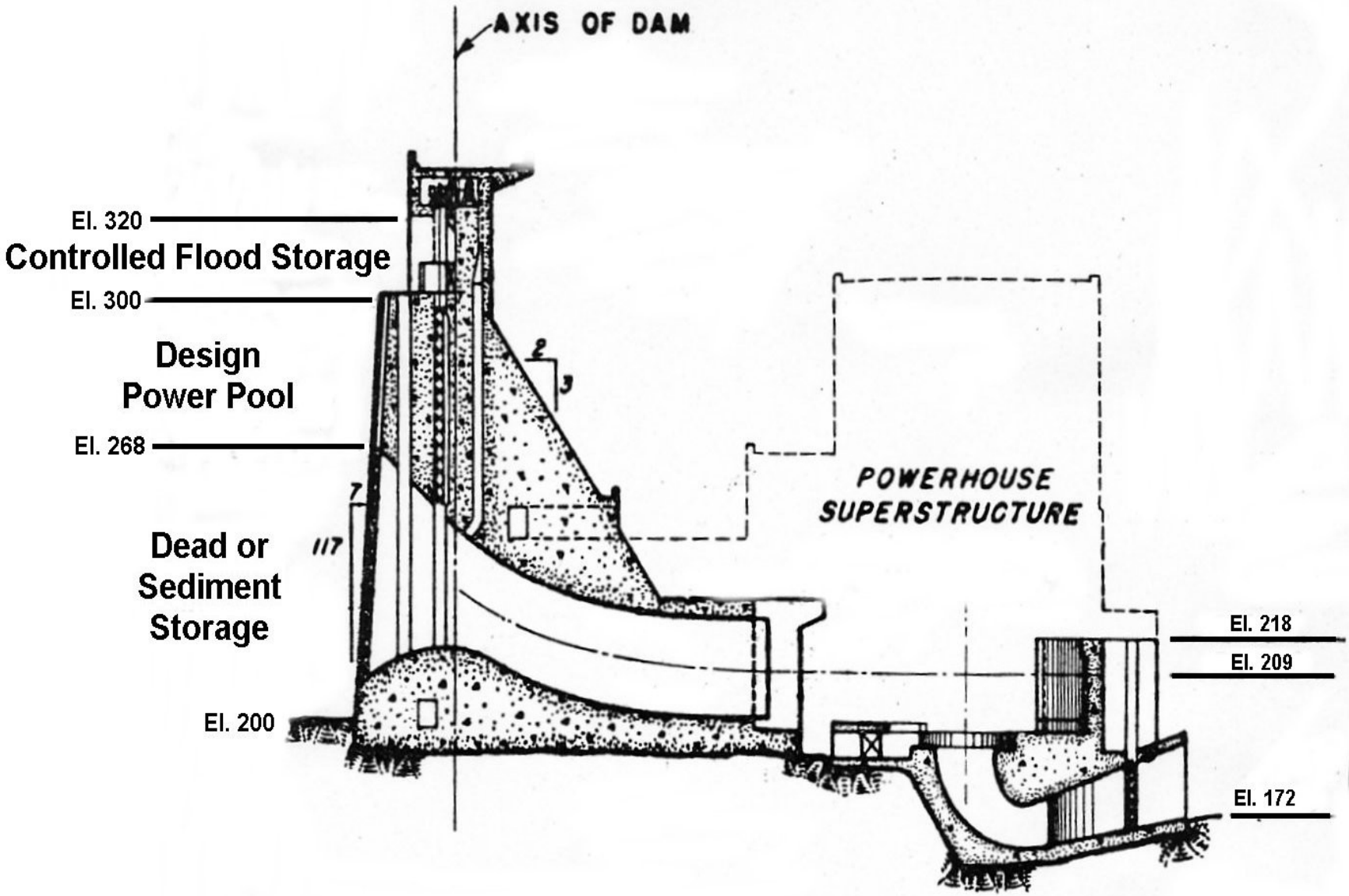
John H. Kerr Dam and Reservoir

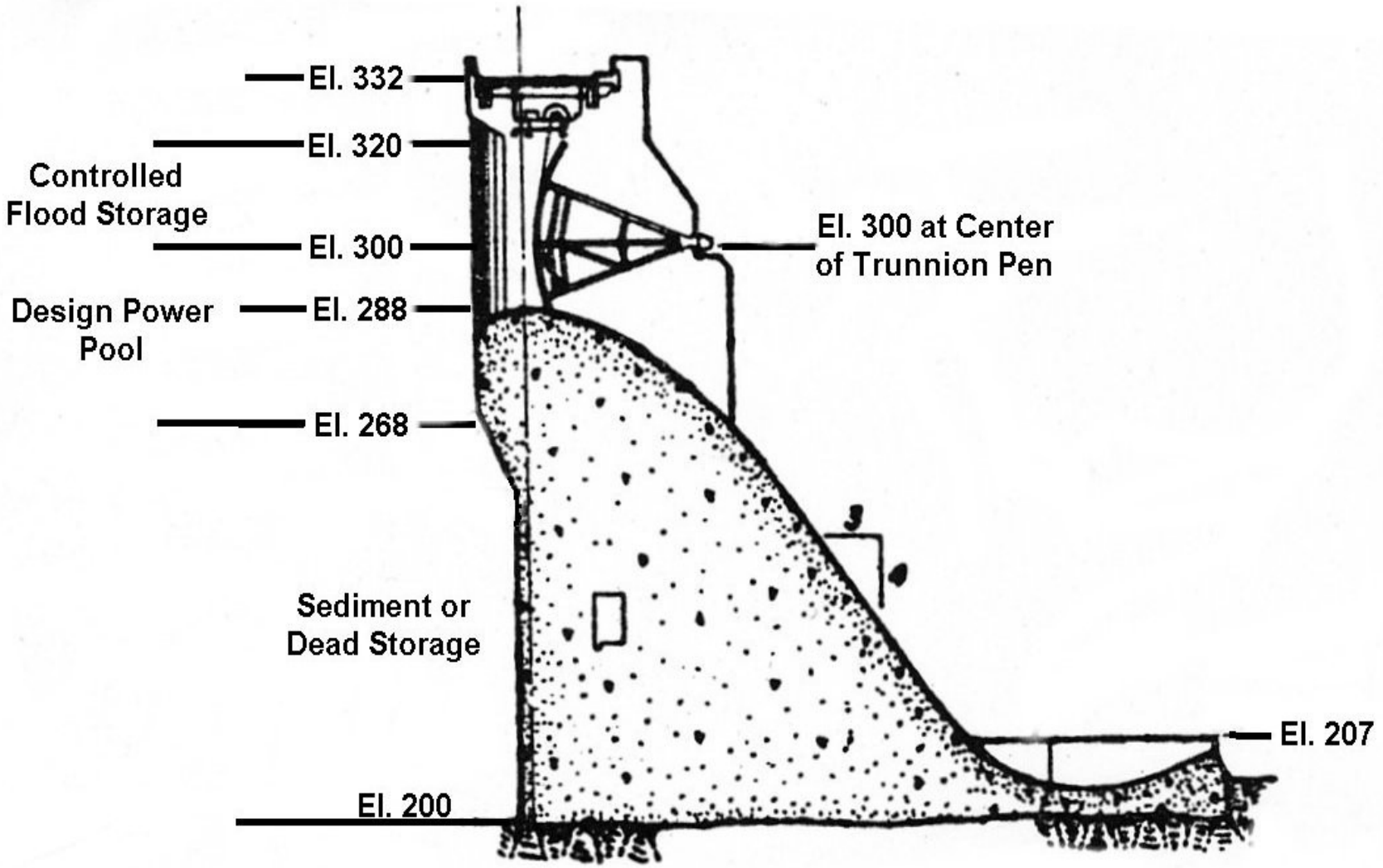
The structure of John H. Kerr Dam required:

- **624,244 cubic yards of concrete,**
- **1,200,000 tons of sand and crushed stone,**
- **7,550,941 pounds of reinforcing steel,**
- **1,317,786 pounds of structural steel,**
- **578,440 barrels of cement and**
- **515,286 pounds of miscellaneous steel and iron**

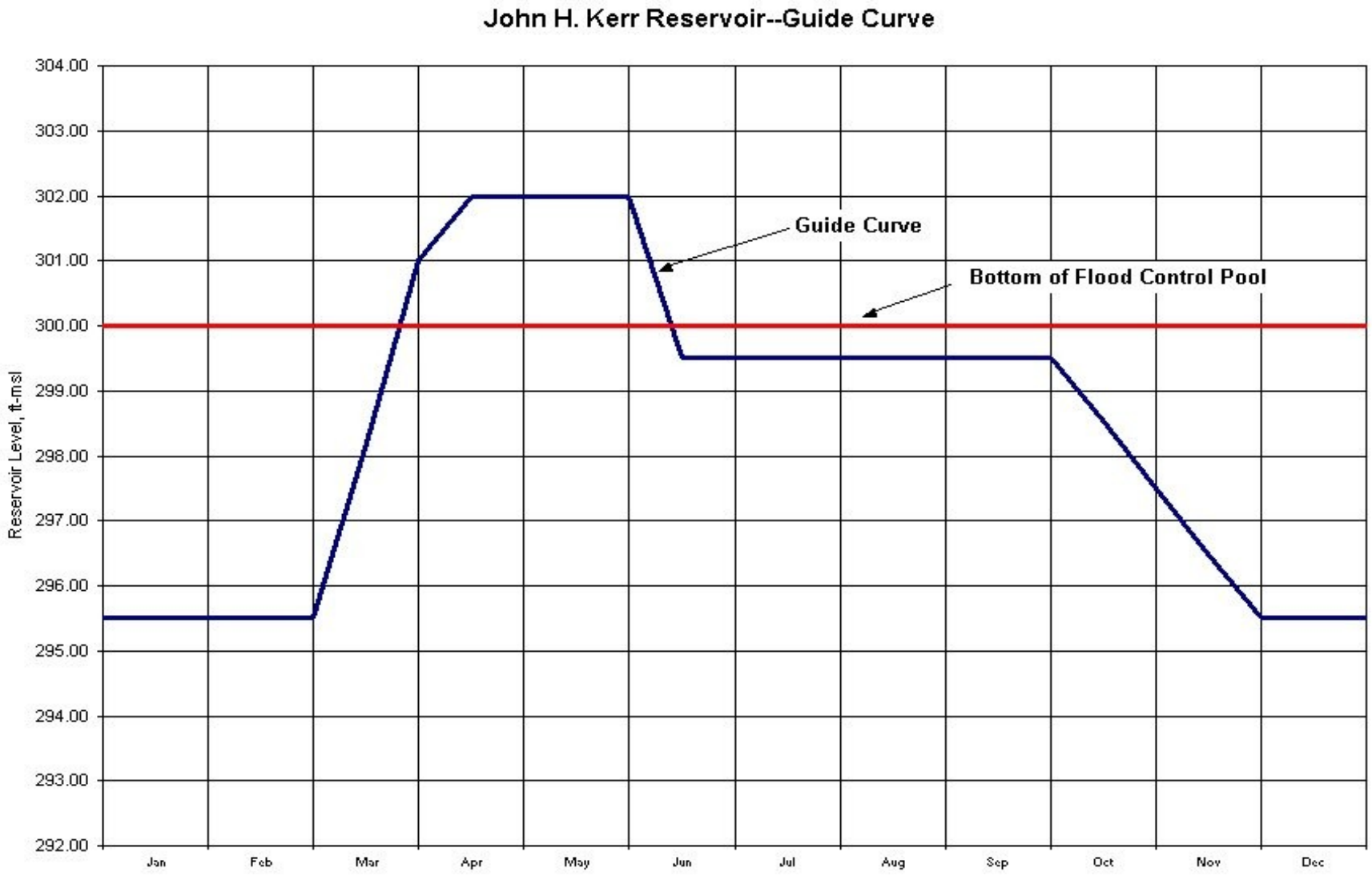
John H. Kerr Dam and



John H. Kerr Dam and



John H. Kerr Dam and Reservoir



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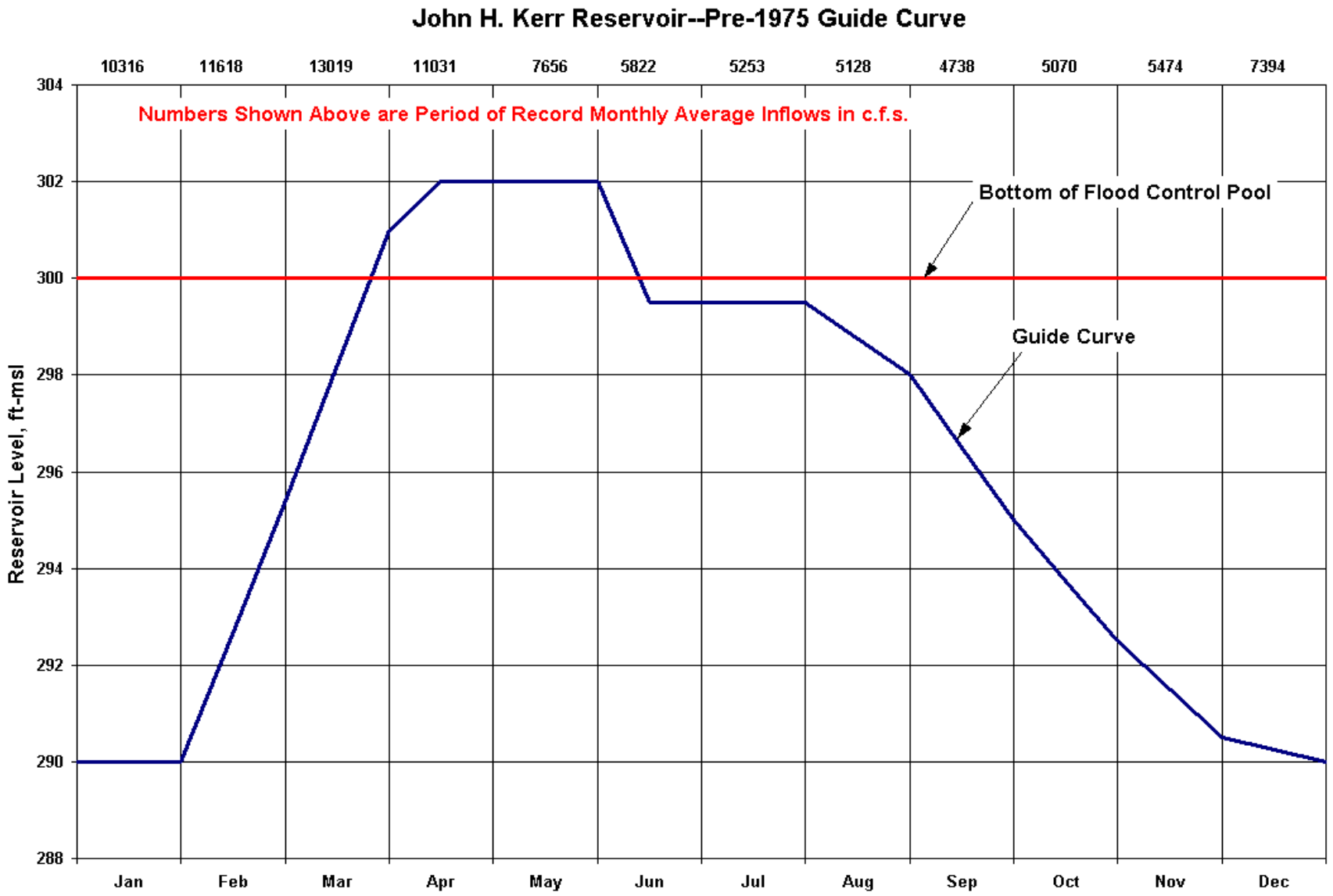

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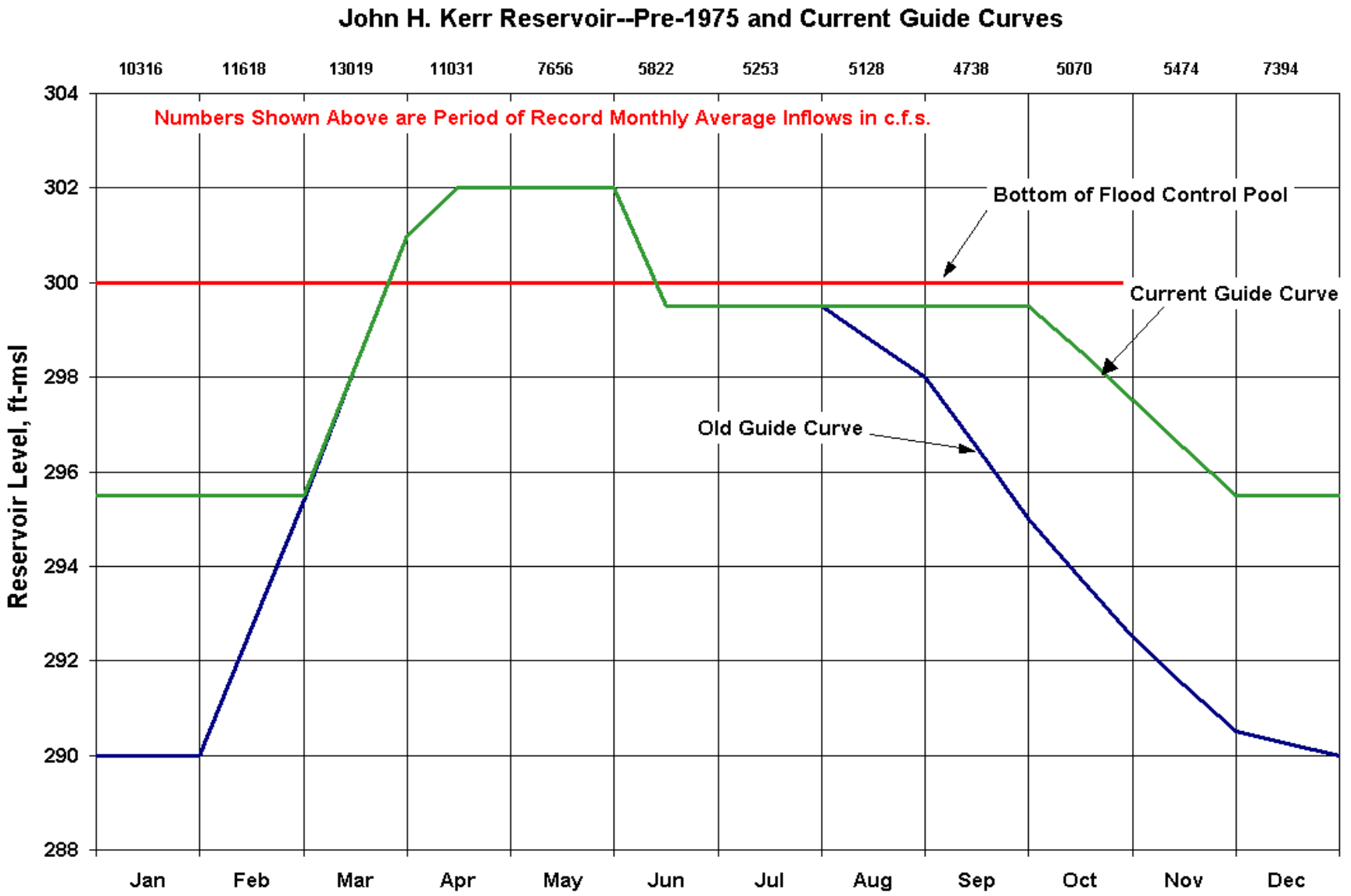

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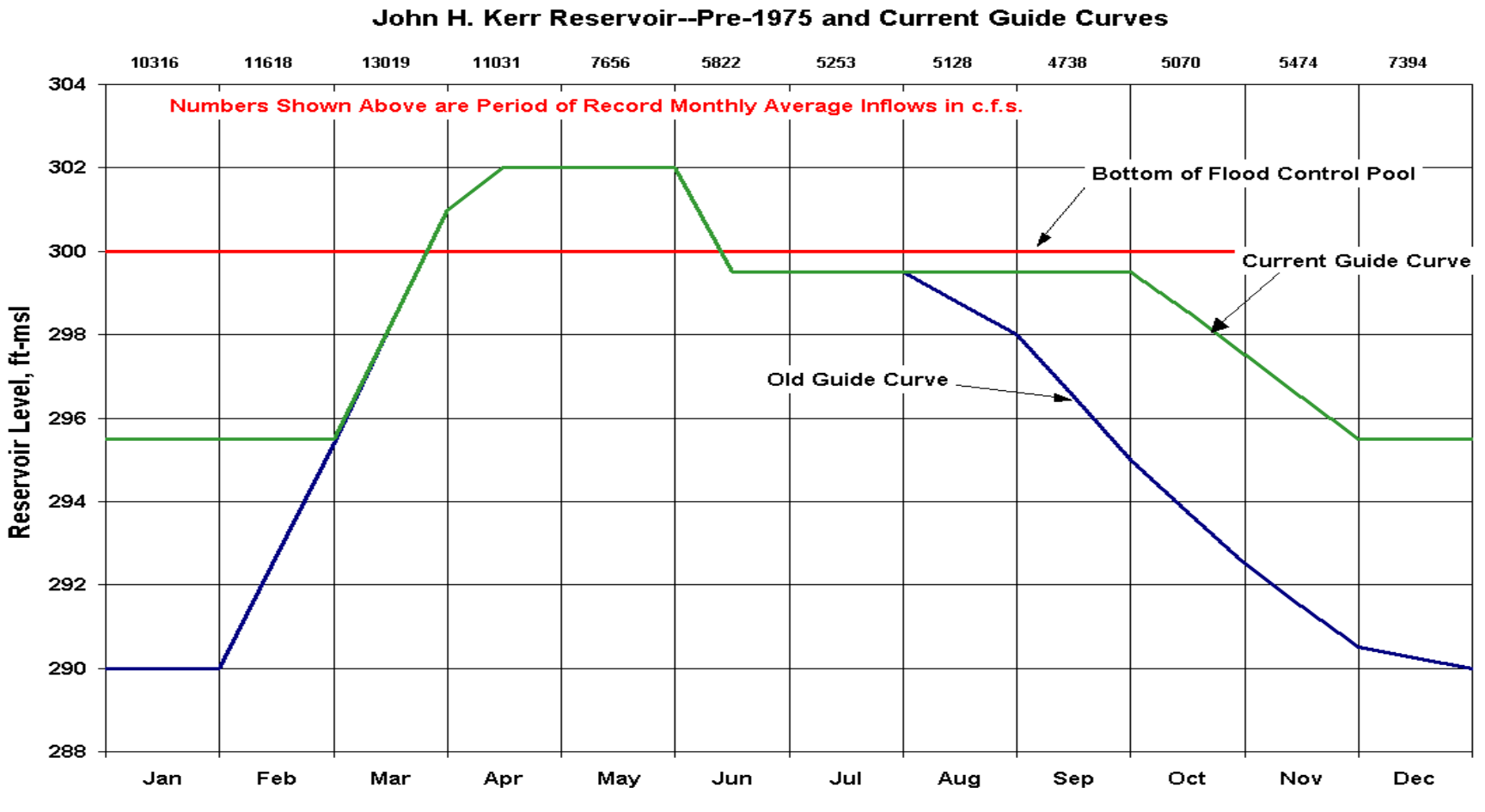
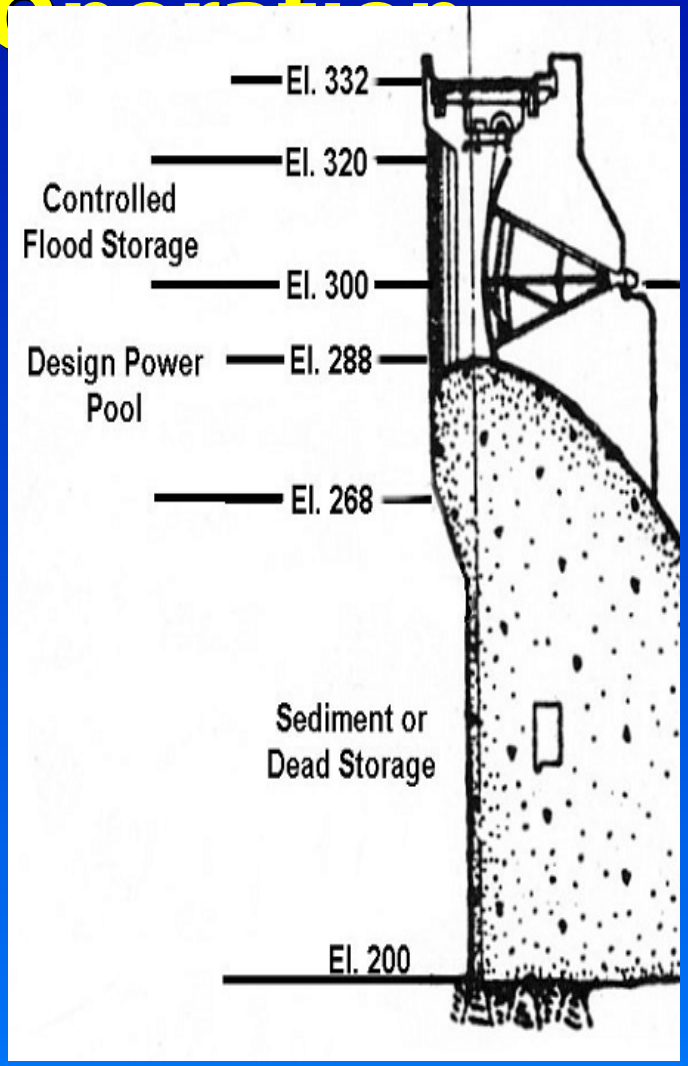


What were the effects of the changed guide curve?

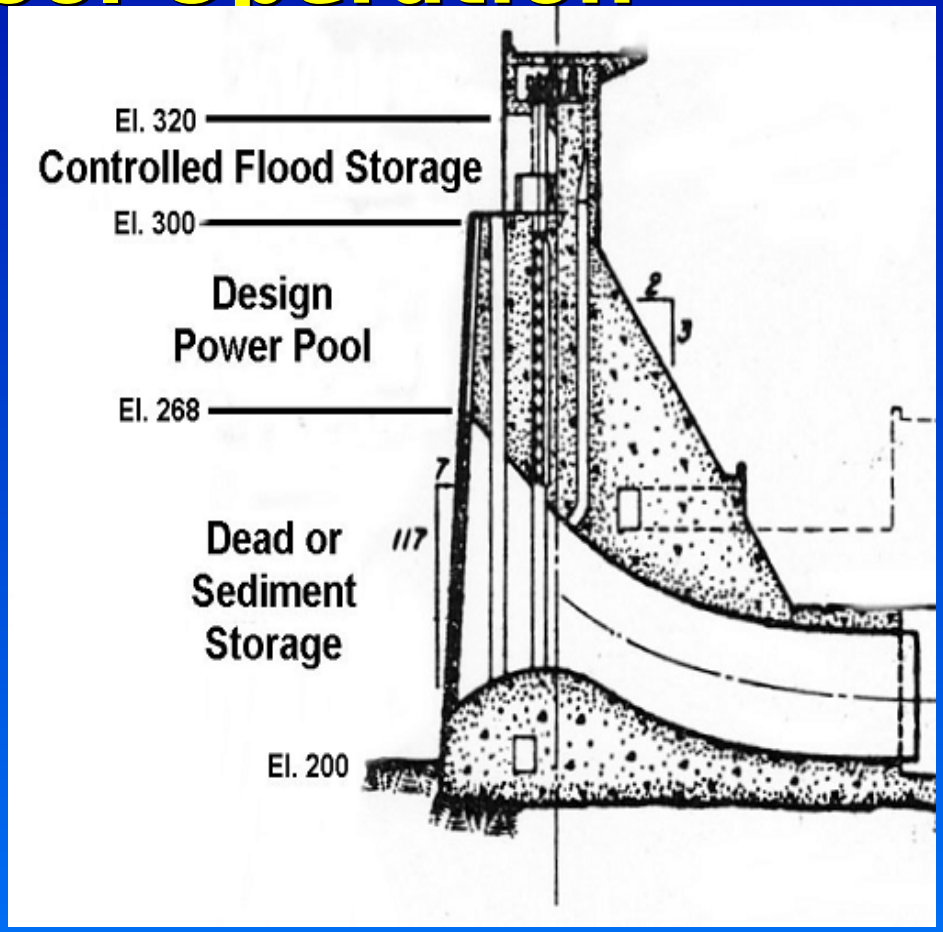
John H. Kerr Dam and Reservoir Operation

Elevation Range	Inches of Runoff	Release at Roanoke Rapids Dam	Comments or Concerns
> 321		100 % of inflow to Kerr Dam	Walkway to Controls at Tainter Gates is at El. 323.25
320 – 321	0.22	85 % of inflow to Kerr Dam	Top of Tainter Gates is at El. 320. Lake Gaston will be surcharged.
315 – 320	0.95	35,000 cfs	Top of Tainter Gates is at El. 320. Lake Gaston may be surcharged. 24 hour courtesy notice is made before releases are made. Timber and farmland impacts and damages.
312 – 315	0.49	25,000 cfs	24 hour courtesy notice may be made. Flooding of timberlands and farmlands. Some damage to farms and crops.
300 – 312	1.64	Up to 20,000 cfs	Interference with timberland and farming interests begins.



John H. Kerr Dam and Reservoir Power Pool Operation

Elevation Range	Release at Roanoke Rapids Dam	Comments or Concerns
Guide Curve to 300	Up to 8,000 cfs	Typical channel capacity at 8,000 cfs
293 – Guide Curve	Varies	293 is bottom of Turbine Dependable Capacity Limits of 225 MW's
268 - 293	Varies	Turbine Dependable Capacity is not met, but contract energy is met weekly.



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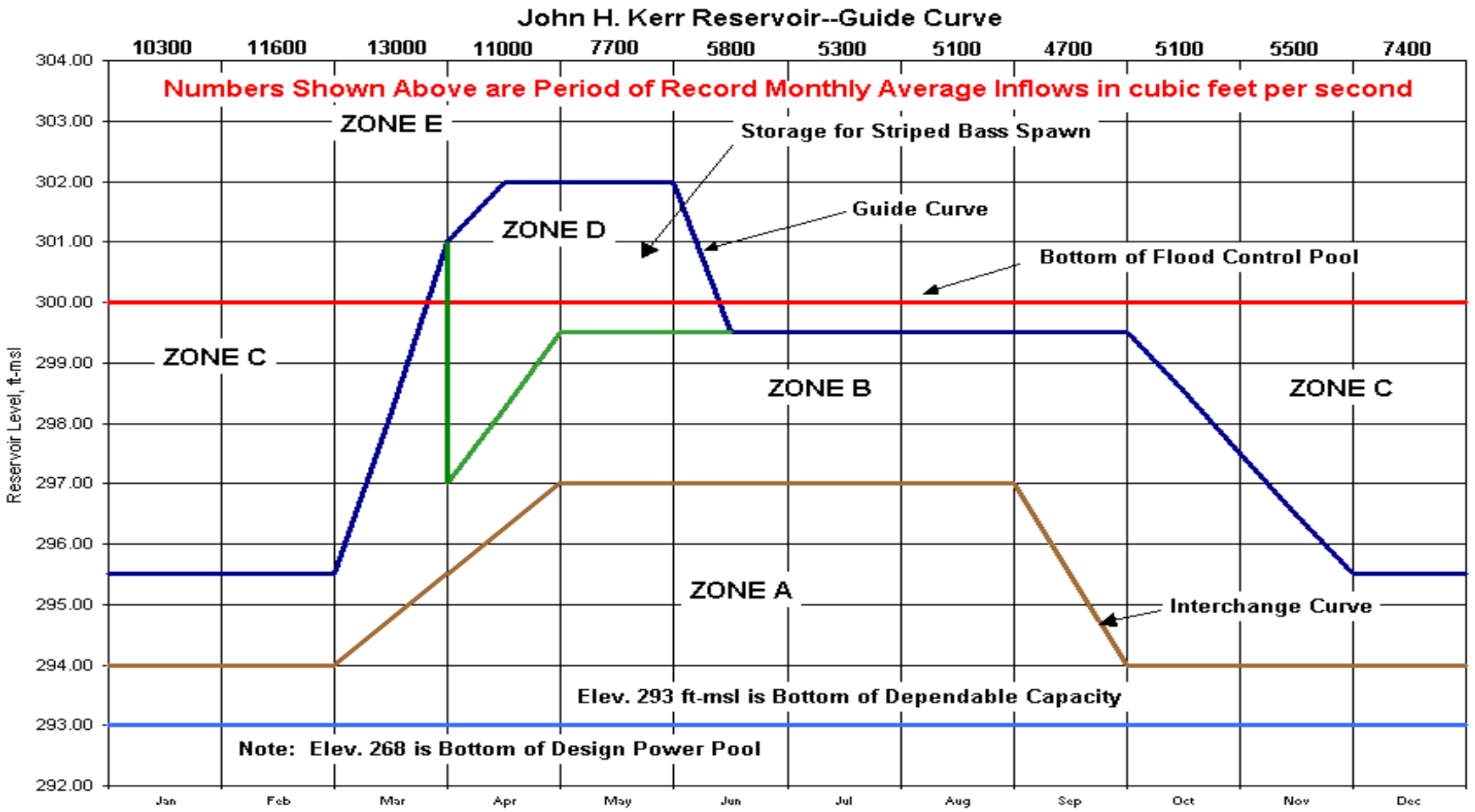
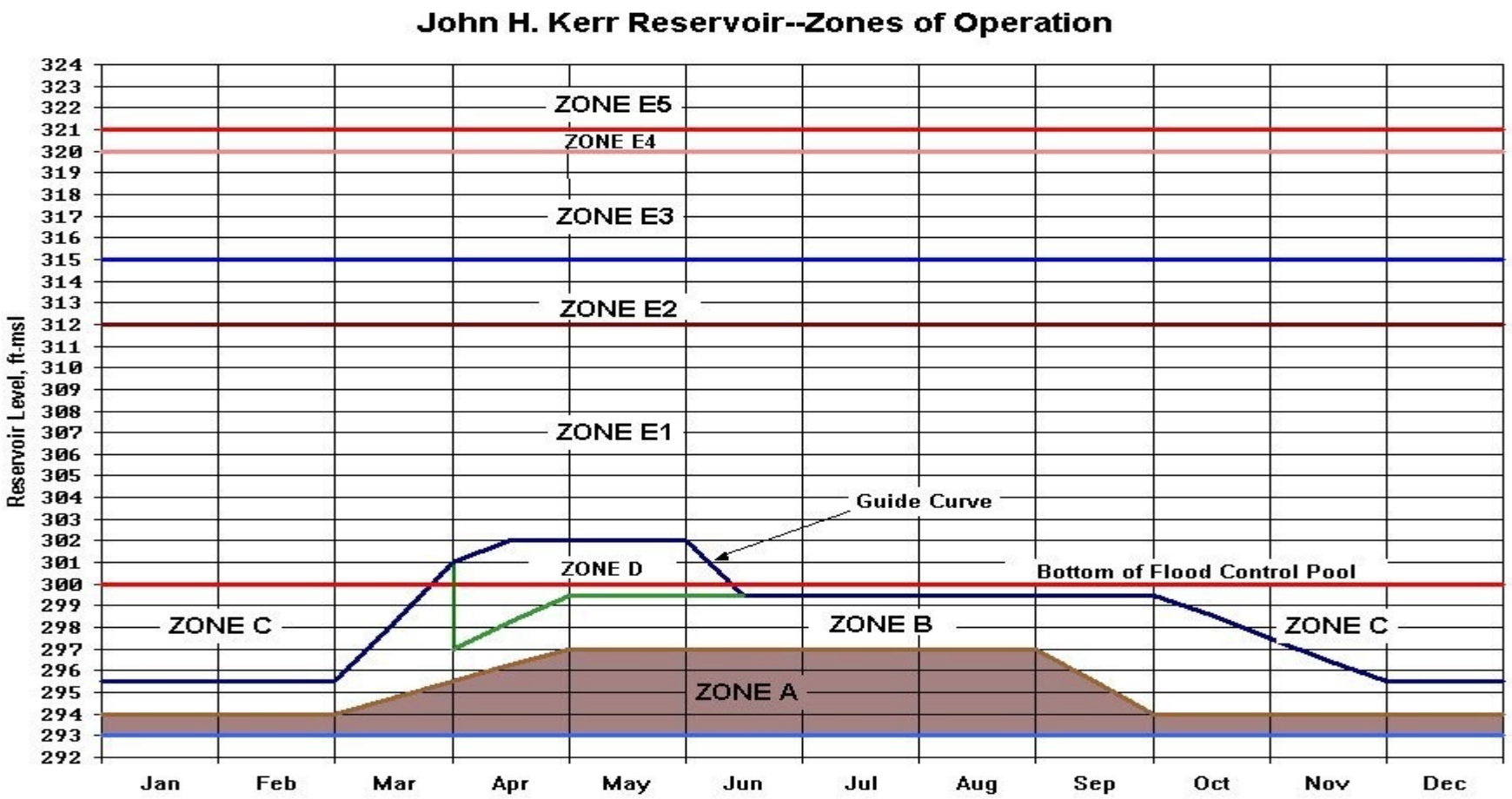
John H. Kerr Dam and Reservoir

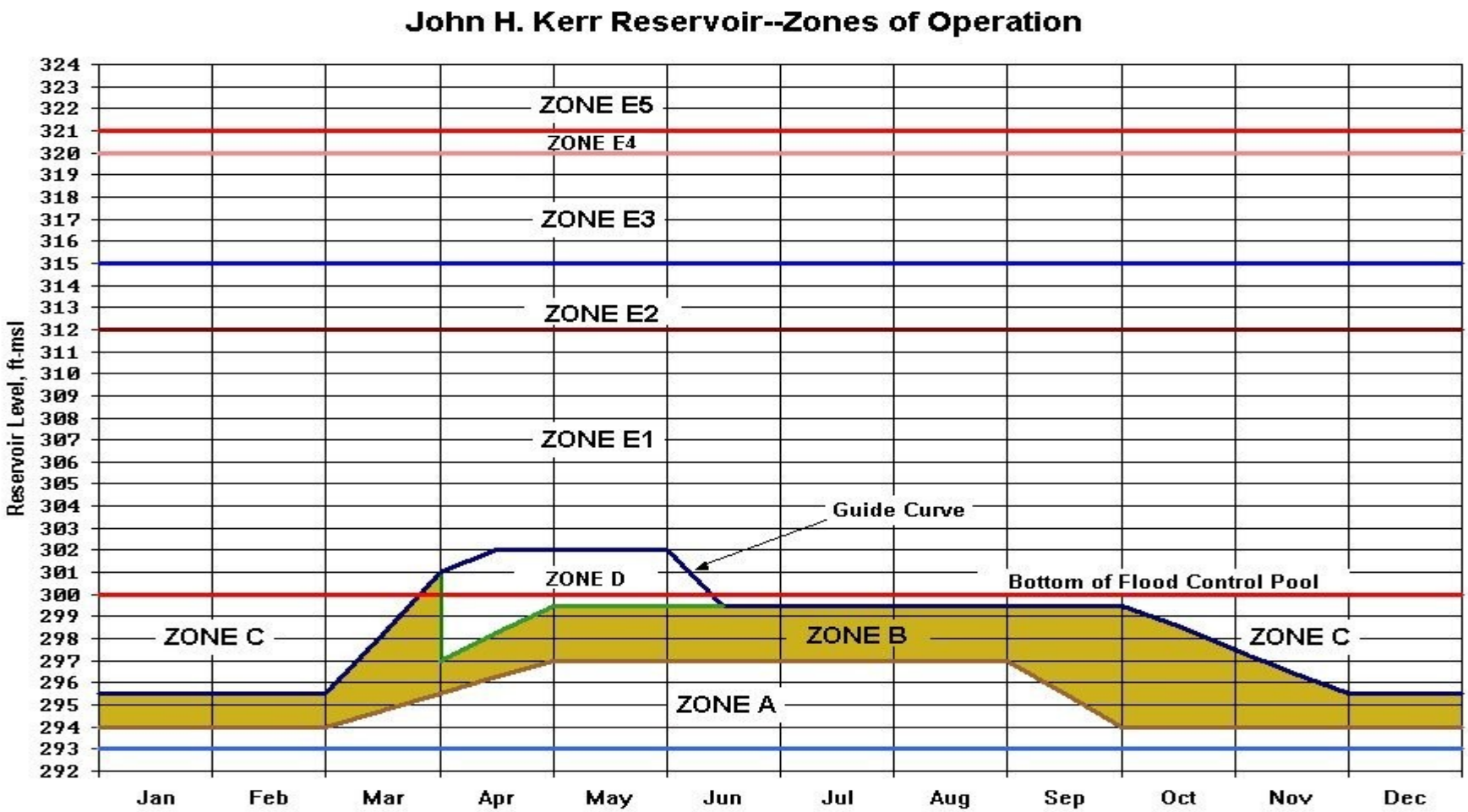


John H. Kerr Reservoir—Zone A



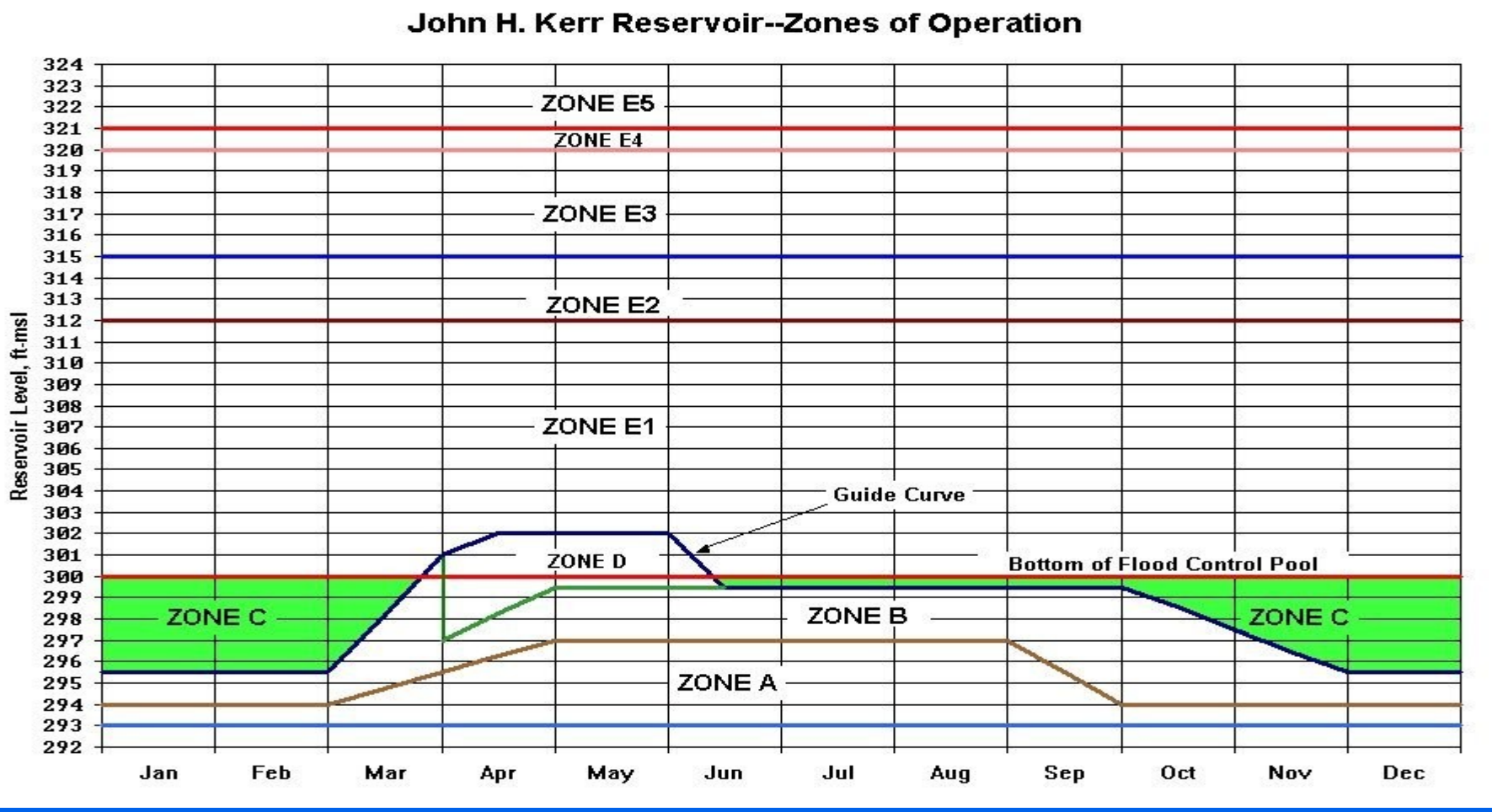
Zone A (Interchange Zone)—The sum of the minimum contract energy amounts are being met by the Kerr-Philpott system in toto. The project having the higher percent of hydropower storage remaining produces the higher portion of total minimum contract energy. Typically enough energy is being produced at each project to meet minimum flow commitments downstream.

John H. Kerr Reservoir—Zone B



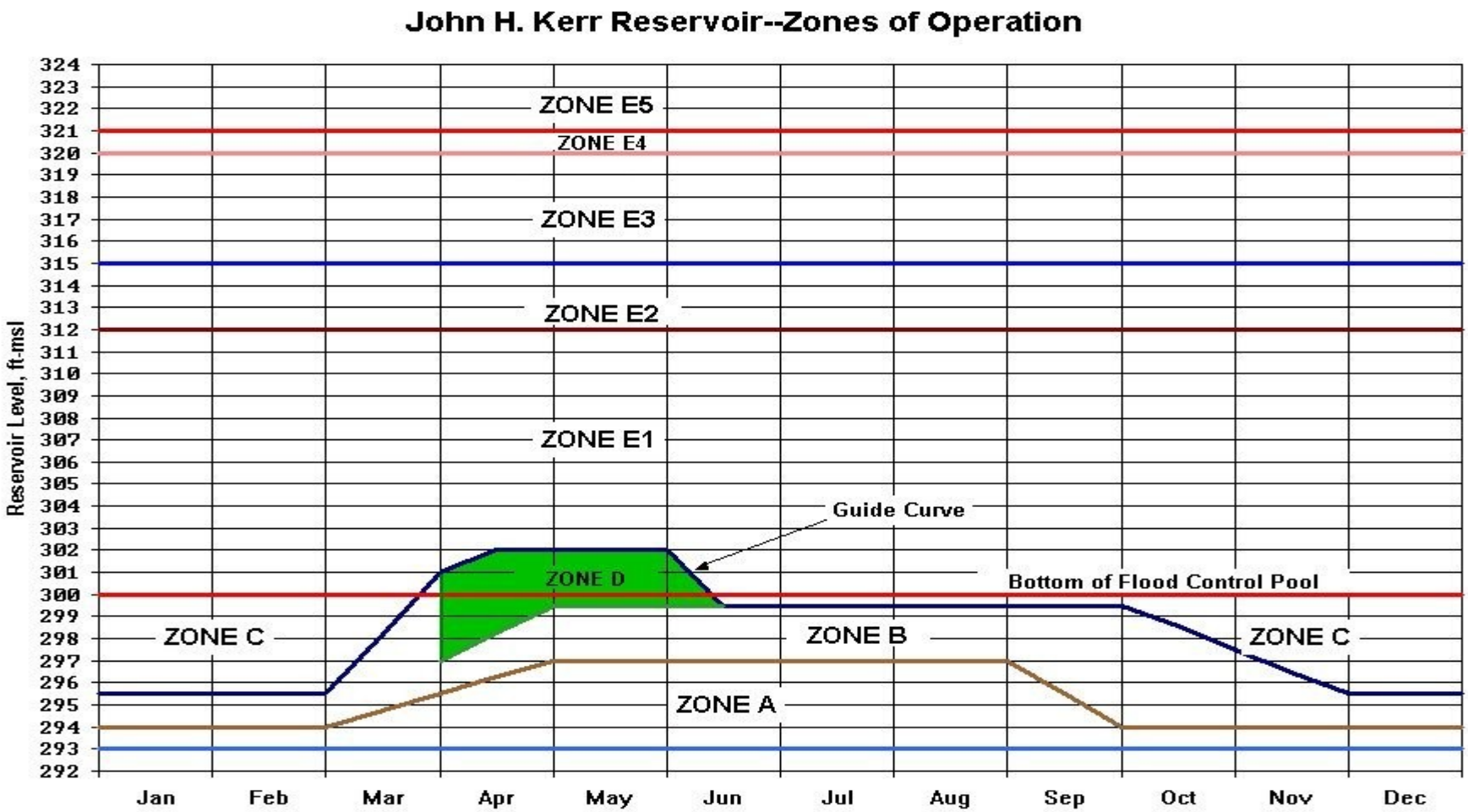
Zone B (Below Guide Curve)—Kerr minimum contract energy amounts are being met by the Kerr project. If Philpott reservoir is in a flood status, then part of Kerr's minimum contract energy will be picked up by Philpott. Enough energy is being declared and turbine discharge produced to provide minimum downstream flow needs.

John H. Kerr Dam—Zone C Operation



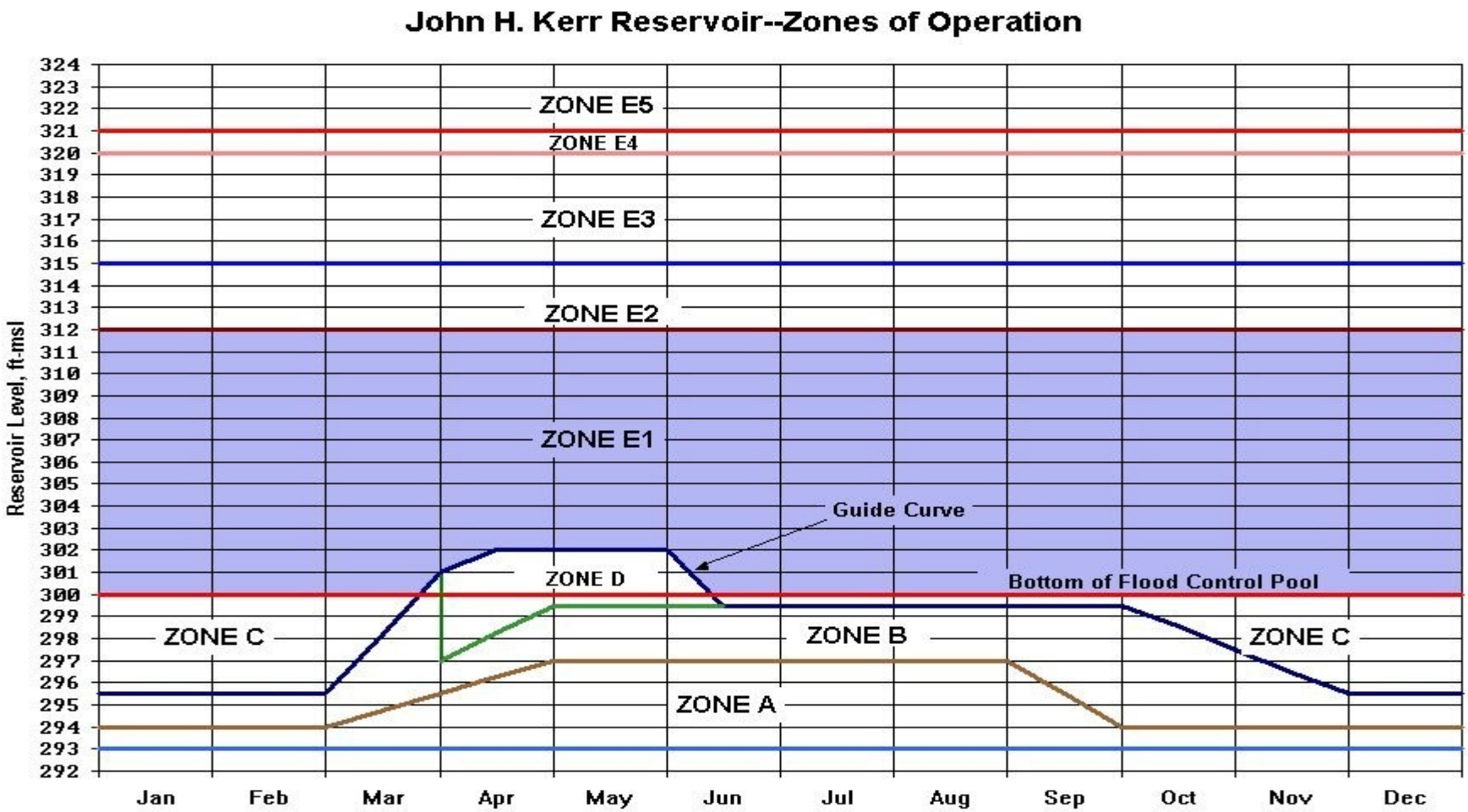
Zone C (Above Guide Curve But Below Bottom of Flood Control Pool)—Minimum energy amounts are being met by the Kerr project. If inflows are high or Kerr Reservoir is high enough above the guide curve, then extra energy and turbine releases are declared. However, releases are not to exceed 8,000 cfs from the Roanoke Rapids Dam into the lower Roanoke River.

John H. Kerr Dam—Zone D Operation



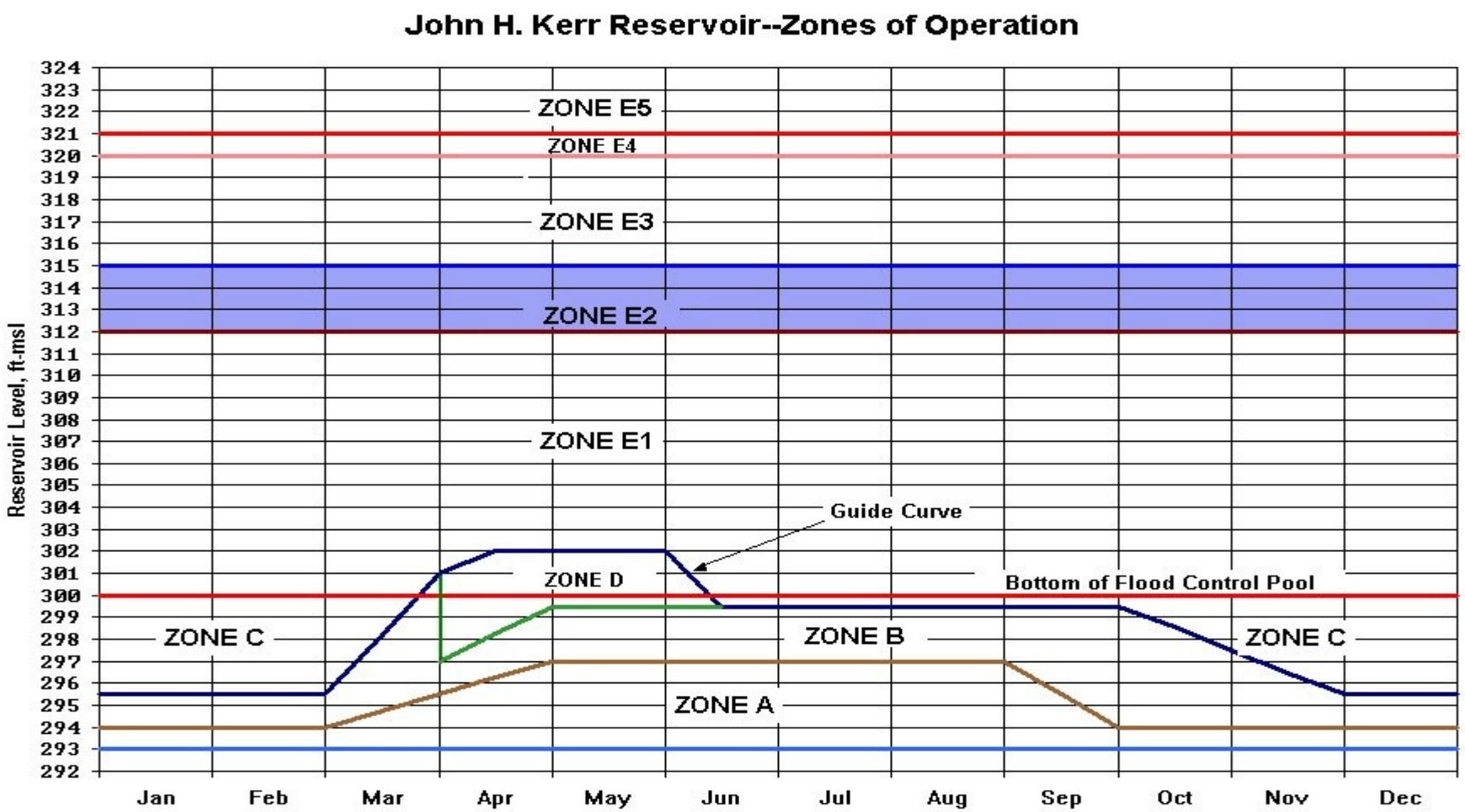
Zone D (Striped Bass Spawn Storage)—Striped bass spawn target flows downstream are made by Kerr Dam and then by Roanoke Rapids Dam. Target flows are bound by a lower, median and upper flow threshold.

John H. Kerr Dam—Zone E1 Operation



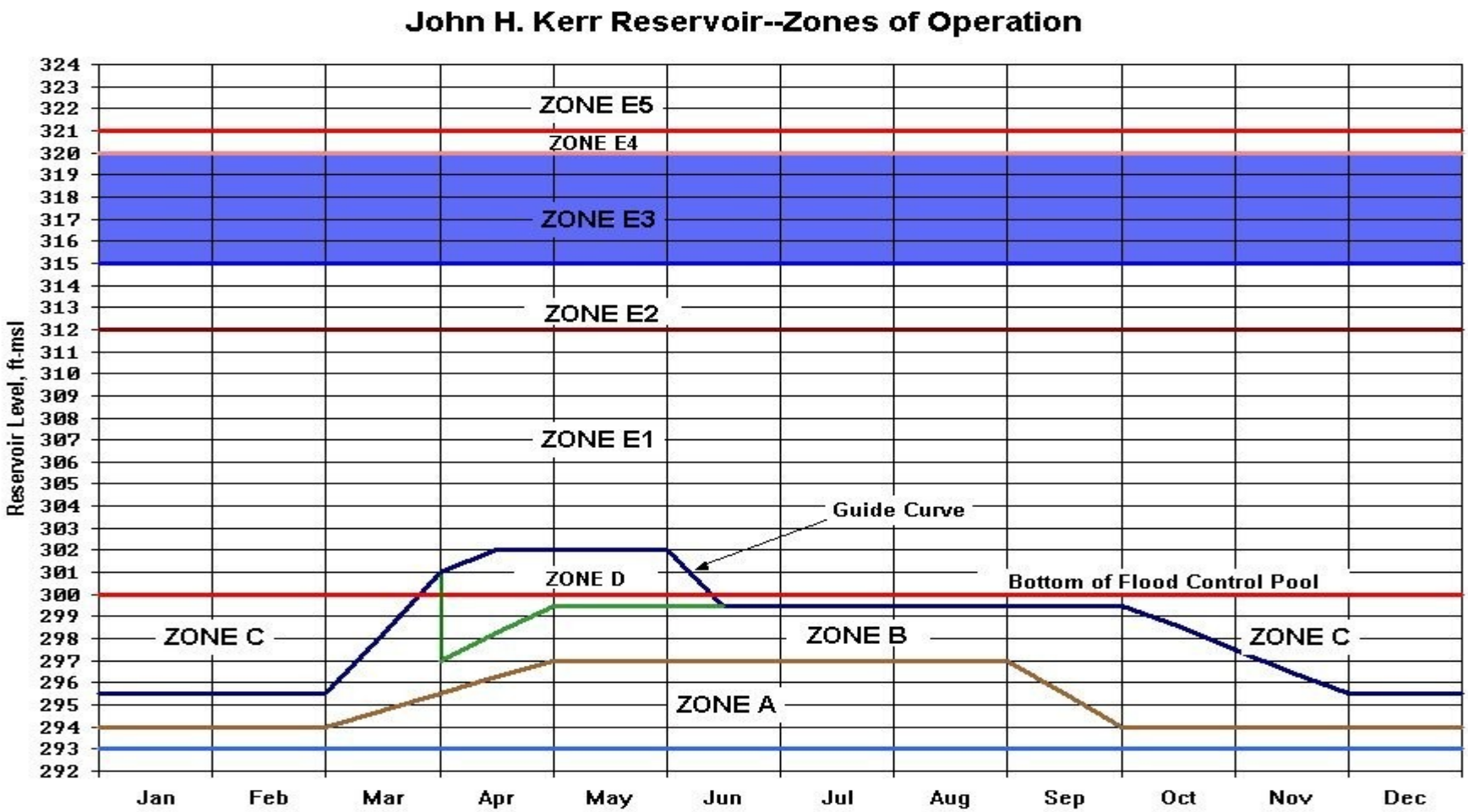
Zone E1 (300 – 312, Lower Controlled Flood Pool)—Will hold 1.64 inches of rainfall runoff. Turbine releases of up to 20,000 cfs are made at Kerr Dam. Releases of 20,000 cfs are made at the Roanoke Rapids Dam. This is full turbine plant at the Roanoke Rapids Dam.

John H. Kerr Dam—Zone E2 Operation



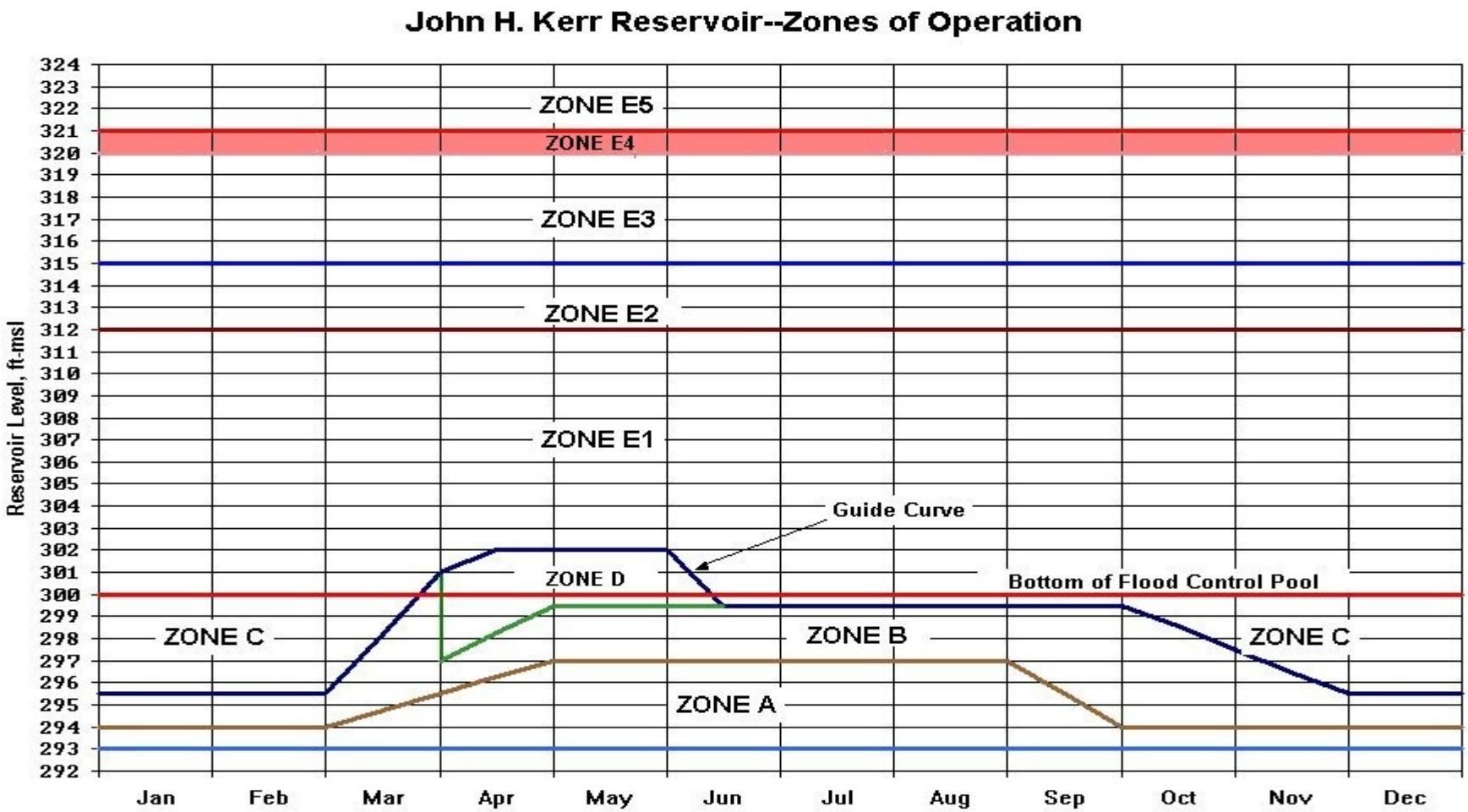
Zone E2 (312 – 315, Middle of Controlled Flood Pool)—Will hold 0.49 inches of rainfall runoff. Turbine releases of up to 25,000 cfs are made at Kerr Dam. Releases of 25,000 cfs are made at the Roanoke Rapids Dam. This is full turbine plant at the Roanoke Rapids Dam plus a spill of 5,000 cfs through the spillway gates.

John H. Kerr Dam—Zone E3 Operation



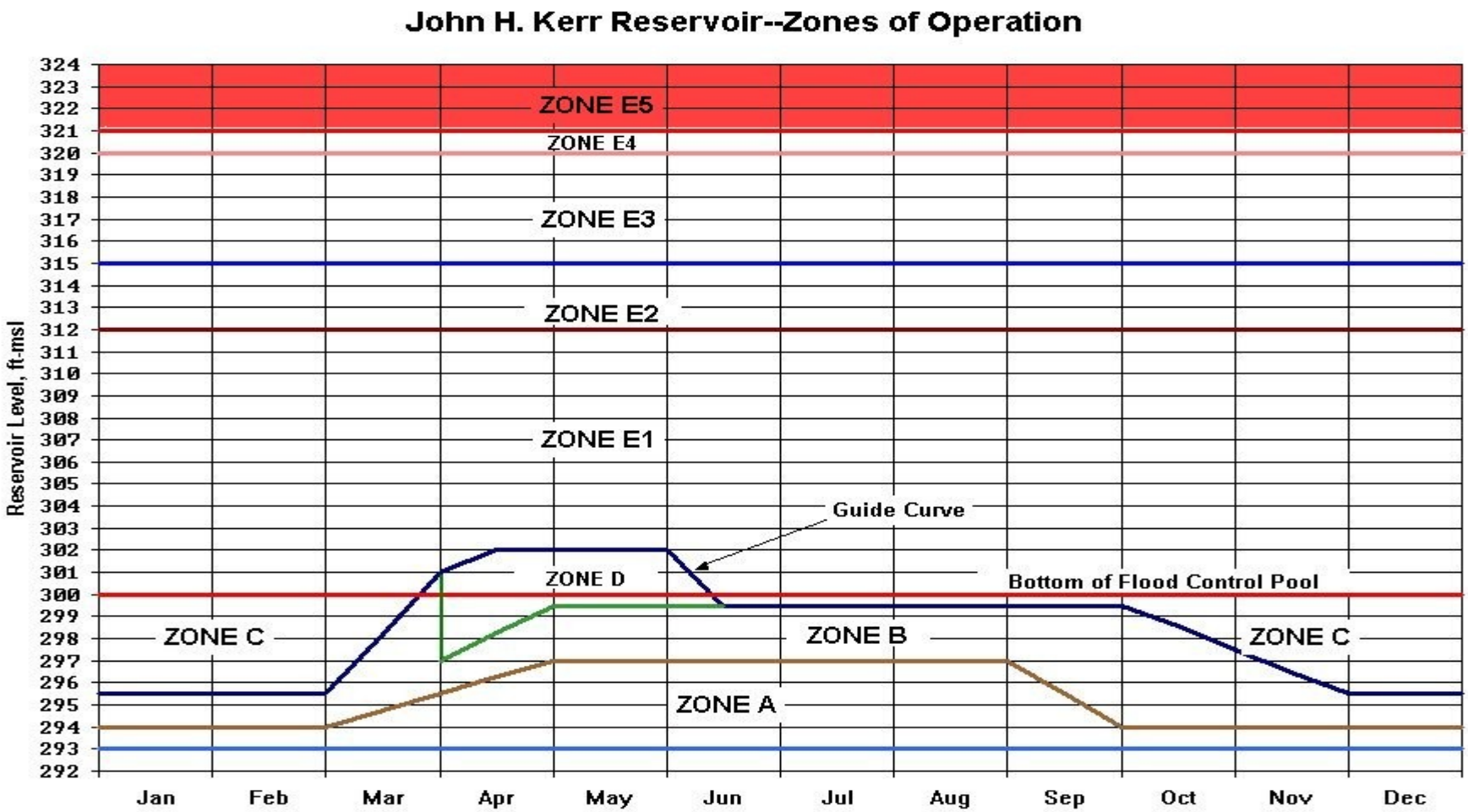
Zone E3 (315 – 320, Upper Part of Controlled Flood Pool)—Will hold 0.95 inches of rainfall runoff. Turbine releases and tainter gate (spillway) releases of up to 35,000 cfs are made at Kerr Dam. Releases of 35,000 cfs are made at the Roanoke Rapids Dam. This is full turbine plant at the Roanoke Rapids Dam plus a spill of 15,000 cfs through the spillway

John H. Kerr Dam—Zone E4 Operation



Zone E4 (320 – 321, Lower Uncontrolled Flood Pool)—Will hold 0.22 inches of rainfall runoff. Turbine releases and tainter gate releases of 85 percent of inflow to Kerr Dam are made in the lower Roanoke River from Roanoke Rapids Dam. Releases will be greater than or equal to 35,000 cfs from RR Dam. Lake Gaston will be surcharged.

John H. Kerr Dam—Zone E5 Operation



Zone E5 (Kerr is Greater than El. 321 - Upper Part of Uncontrolled Flood Pool)—Tainter gate releases of 100 percent of inflow to Kerr Dam are made in the lower Roanoke River from Roanoke Rapids Dam. Releases from Roanoke Rapids Dam will be equal to or greater than 35,000 cfs.

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John H. Kerr Dam and Reservoir
Upstream and Downstream Users

Upstream Users	Downstream Users
Recreation	Recreation
Hydropower	Hydropower
Water Supply	Water Supply
Wildlife and Fisheries	Wildlife and Fisheries
Industry and Urban	Industry and Urban
	Timber Harvesting
	Prison Farm

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John H. Kerr Dam and Reservoir
Upstream verses Downstream Operational Conflict Example

- **Upstream Recreation verses Downstream Recreation.**

Upstream recreation interests prefer a stable lake level with inflows passed downstream unbuffered whether they are large or small.

Downstream recreation interests prefer a steady river in which to fish and boat. This means storing flood waters behind Kerr Dam with high lake levels which impact upstream recreation users. This also means lower reservoir levels during drought events when extra water is released from Kerr Reservoir to

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John H. Kerr Dam and Reservoir Upstream verses Downstream Flood Release Operational Conflict

- **Upstream Hydropower verses Downstream Hydropower:**

Upstream: The turbines at Kerr Dam can pass about 33,000 cfs during a flood event.

Downstream: The turbines at the Dominion Roanoke Rapids Dam located downstream can only pass flows up to 20,000 cfs and have to spill additional flood releases with a loss of hydropower generation and a loss of revenue. Dominion would prefer capping flood releases at Kerr Dam to an average of 20,000 cfs.

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John H. Kerr Dam and Reservoir Downstream verses Downstream Flood Release Operation Conflict

- **Downstream Timber Harvesting, Hunters and Fishing Interests:**

Prefer flood releases to be capped at 8,000 cfs (river channel capacity). But if the flood storage in Kerr Reservoir is threatened, then 35,000 cfs or higher would be ok to limit the duration of the flood plain flooding.

- **Downstream Agricultural Interests:**

Prefer capping long term flows at 20,000 cfs. Flows greater than 20,000 cfs impact crop and grazing lands and flood farm roads. Some farm lands may be impacted at flows exceeding

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John H. Kerr Dam and Reservoir Operational Conflict For Downstream verses Downstream Continued.....

- **Downstream Non-agricultural Interests:**

These interests could withstand flows possibly up to 45,000 cfs during extreme floods without damage to property. Preference is to see flows to about 40,000 cfs to reduce duration of flood flows.

- **Downstream Prison Farm:**

Earthen dike protects this area that would be threatened by flows of 35,000 cfs and overtopped by flows of 40,000 cfs. Preference is to wisely use the controlled flood storage

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John H. Kerr Dam and Reservoir Project Accomplishments

Flood Damages Prevented

- $390,852,800 total since filling

Average Annual Hydropower Generation

- 433,817,800 kWH

Typical Annual Recreational Visitation

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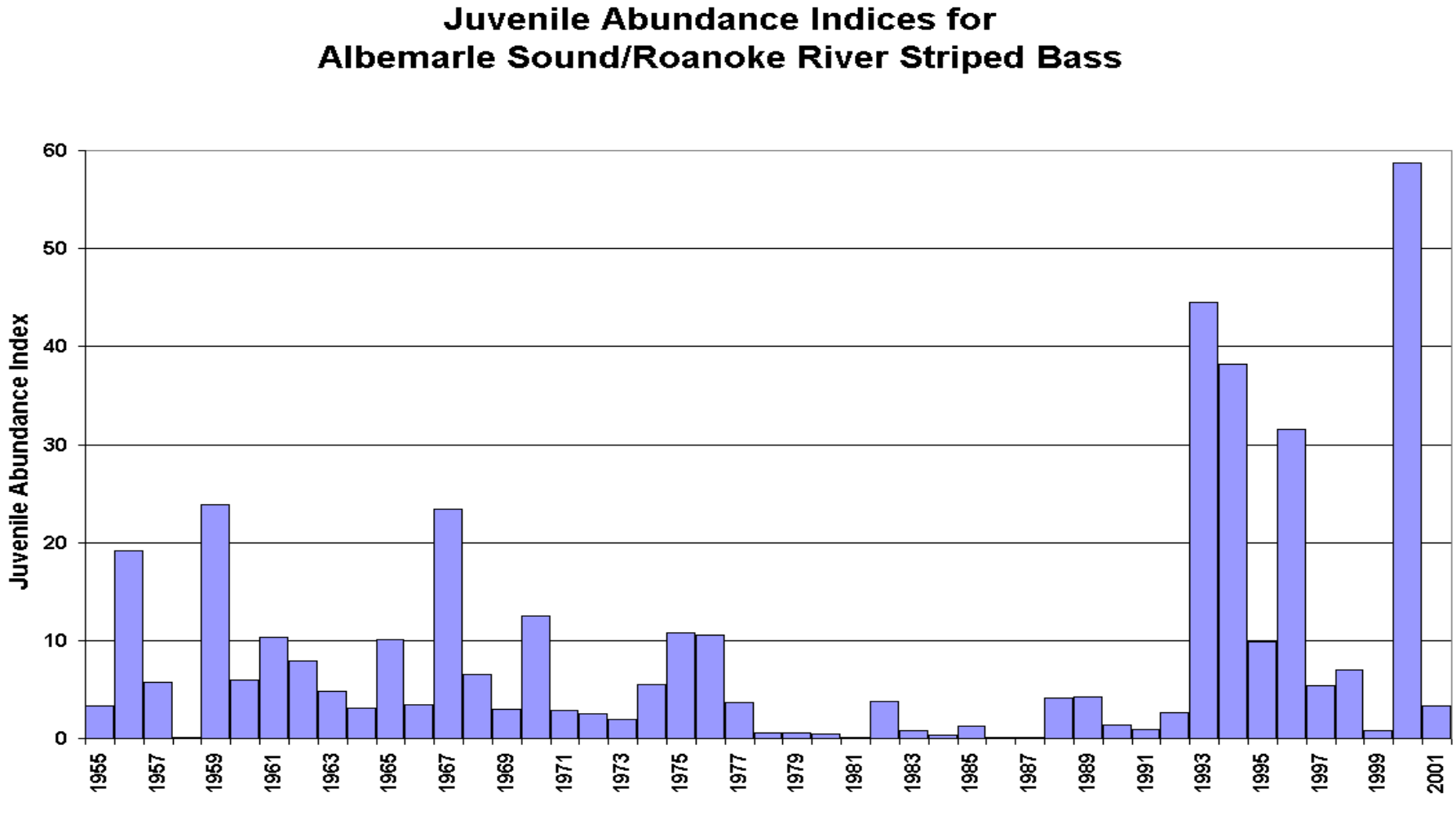
John H. Kerr Dam and Reservoir
Striped Bass Spawn Success



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